of the invention.
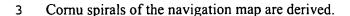
What is claimed is:

CLAIMS

1   1.   A vehicle navigation system that receives sensor data from a plurality of sensors,

2   and provides a map image that is presented on a display, said system comprising:

3   a navigation map data memory that includes map data indicative of roadways

4   stored in Cornu spiral form; and

5   a navigation processing unit that receives the sensor data, and requests map data

6   from said navigation map data memory associated with the sensor data, and computes the

7   map image from said map data.

1   2.   The vehicle navigation system of claim 1, wherein said map data includes a data

2   indicative of a unit Cornu spiral.

1   3.   The vehicle navigation system of claim 2, wherein said navigation processing unit

2   computes said map image using Cornu spiral polynomial coefficients stored in said

3   navigation map data memory.

1   4.   The vehicle navigation system of claim 2, wherein terms of polynomials of the unit

2   Cornu spiral are stored in said navigation map data memory and said map image is

3   computed using said terms of polynomials of the unit Cornu spiral.

1   5.   The vehicle navigation system of claim 4, wherein said terms of polynomials are

2   associated with Taylor series expressions indicative of said Cornu spiral.

1   6.   The vehicle navigation system of claim 5, wherein said Cornu spiral is of the form

2    $l = Ka^2$, where l is indicative of arc length and K is indicative of curvature.

1   7.   The vehicle navigation system of claim 5, wherein said navigation map data

2   memory includes coordinates of the unit Cornu spiral stored in a table, from which all the

3   Cornu spirals of the navigation map are derived.

1   8.   The vehicle navigation system of claim 5, wherein said navigation map data

2   memory includes coordinates of the unit Cornu spiral stored in a table, from which all the

3   Cornu spirals of the navigation map are derived for roads, railroad lines, rivers, lakes, and

4   similar cartographic parameters defined as Cornu spirals.

1   9.   A vehicle navigation system that receives sensor data from a plurality of sensors,

2   and provides a map image that is presented on a display, said system comprising:

3   a navigation map data memory that includes map data indicative of roadways

4   stored in Cornu spiral form; and

5   means for receiving the sensor data, for requesting map data from said navigation

6   map data memory associated with the sensor data, and for computing the map image from

7   said map data.

1   10.   The vehicle navigation system of claim 9, wherein said map data includes data

2   indicative of a unit Cornu spiral.

1   11.   The vehicle navigation system of claim 10, wherein said navigation processing unit

2   computes said map image using Cornu spiral polynomial coefficients stored in said

3   navigation map data memory.

1   12.   The vehicle navigation system of claim 11, wherein terms of polynomials of the

2   unit Cornu spiral are stored in said navigation map data memory and said map image is

3   computed using said terms of polynomials of the unit Cornu spiral.

1   13.   The vehicle navigation system of claim 12, wherein said terms of polynomials are

2   associated with Taylor series expressions indicative of said Cornu spiral.

1   14.   The vehicle navigation system of claim 13, wherein said Cornu spiral is of the form

2    $l = Ka^2$, where l is indicative of arc length and K is indicative of curvature.

1   15.   The vehicle navigation system of claim 13, wherein said navigation map data

2   memory includes coordinates of the unit Cornu spiral stored in a table, from which all the

3   Cornu spirals of the navigation map are derived.

1   16.   The vehicle navigation system of claim 13, wherein said navigation map data

2   memory includes coordinates of the unit Cornu spiral stored in a table, from which all the

3   Cornu spirals of the navigation map are derived for roads, railroad lines, rivers, lakes, and

4   similar cartographic parameters defined as Cornu spirals.

1   17.   A method of computing a map image in a vehicle navigation system that receives

2   sensor data from a plurality of sensors, comprising:

3   providing map data indicative of roadways stored in Cornu spiral form in a

4   navigation map data memory device;

5   receiving the sensor data, and in response thereto requesting map data from said

6   navigation map data memory device; and

7   computing the map image from said map data.